CHAPTER 4
Proposed Minimum Aquifer Level Criteria for LWC Aquifers/Recovery Prevention Plan

I. Minimum Level Criteria

Significant harm is defined as a loss of specific water resource functions that take multiple years to recover, which results from a change in surface water or ground water hydrology. Based on the functions and information pertaining to the Lower West Coast aquifers provided, the following are the proposed minimum levels for the Lower West Coast aquifers.

Water Table Aquifer: As discussed in Chapter 3, the water resource functions considered for this aquifer include, 1) surface water base flow to rivers, streams, creeks and sloughs, 2) base flows to isolated wetlands, 3) water storage and supply and 4) structural support to the overburden. However, significant deficiencies in data quantifying the relationship between groundwater levels and surface water hydrology exist. Filling these gaps in information is needed in order to make a determination regarding what hydrologic deviation would constitute significant harm to major surface water bodies with the Lower West Coast Planning Area. Considering the ongoing status of research geared towards addressing these deficiencies, staff concludes that minimum levels for the Water Table aquifer should be postponed until best available information is available. Staff shall revisit the establishment of minimum aquifer levels for the Water Table aquifer upon the completion of 1) the isolated wetland study and 2) the Southwest Florida Feasibility Study. Both of these studies are anticipated to be completed in three years. At that time, minimum flows and levels for specific surface water bodies and the Water Table aquifer can be developed jointly through the Lower West Coast Water Supply Plan update process. In the mean time, the District shall use the consumptive use permit "no harm"
criteria and the water shortage authority to protect the surface water resources from over pumpage.

Lower Tamiami, Sandstone and Mid-Hawthorn aquifers: The two identified water resource functions served by these aquifers include 1) water supply and 2) structural support to overburden. Based on this, Staff considers that significant harm would occur to these aquifers if water levels within any non-pumping observation well penetrating the aquifer, dropped below the structure top of the aquifer. The top of the aquifer should be defined using the lithologic and hydrologic characteristics described in District groundwater reconnaissance reports referenced herein on a site by site basis.

Floridan Aquifer System: Like the semi-confined aquifers listed above, the two identified water resource functions served by the Floridan Aquifer System include 1) water supply and 2) structural support to overburden. However, based on the depth, the high yield and the saline nature of the aquifer system, the identified function water supply does not appear to be threatened by forecasted development in the next twenty years. Therefore no minimum aquifer levels are proposed for this system.

II. Recovery/Prevention Plans:

Pursuant to legislative directions, and utilizing the information provided in the Lower West Coast Water Supply Plan (SFWMD, 2000), the proposed minimum aquifer levels for the Lower Tamiami, Sandstone and Mid-Hawthorn aquifers were evaluated against existing and projected ground water level data to determine if the proposed minimum aquifer levels are being, or would be exceeded over the next 20 years. Based on the conclusions contained in the LWCWSP, staff concludes that the minimum levels are not and will not be exceeded over the next twenty years. Therefore a recovery plan, as discussed in Chapter 373.0421(2) F.S., is not needed. However in order for the presumption to hold true over the next twenty years, a prevention plan is proposed as follows.

1) The District should continue to issue water use permits using the no harm criteria contained in the permit rules at a 1 in 10 LOC.

2) The District should develop new rules that limit the cumulative reduction of the potentiometric head in the Lower Tamiami, Sandstone, and Mid-Hawthorn aquifers to a "maximum developable limit". This MDL should be established at a level above the top of the aquifer (approximately 40 feet above the top of the aquifer) sufficient to accommodate the aquifer compaction criteria and two phases of water shortage cutbacks. Once the MDL rule is established, no water uses permit applications would be authorized that cause a reduction in the potentiometric head below the MDL up to and including a 1 in 10 year drought condition (1 in to LOC).

3) The District shall continue to utilize its authority to implement water shortage restrictions during extreme drought condition and to avoid exceedances of the proposed MALs. The District should propose revisions to the water shortage criteria contained in rules 40E-22 that identify the levels within the semi-confined aquifers where staff would consider recommending Phase I and Phase II water shortage cutbacks.

4) The District shall work with local governments to evaluate the feasibility of alternative irrigation supplies along coastal Lee and Collier Counties consistent with recommendation no. 4.1 of the LWCWSP (SFWMD,2000). In addition, the District shall work with local governments to develop ordinances which require new developments to construct irrigation piping throughout the project and to prohibit the construction of new wells into aquifers where the MDL has been reached.

Additional Water Resource Protection Measures: Water Use Regulation

As discussed in Chapter 1, the minimum aquifer levels are only a part of the overall tools to protect the water resources. The following is a discussion of the consumptive use permitting (CUP) criteria applicable to aquifer protection to assist the reader better understand the other protections afforded the water resources. These resource protection tools will complement the recover and prevention strategy above.

The District's consumptive use permitting program contains criteria to prevent harm to the water resource under normal to moderate drought conditions. As a result of implementing this program, withdrawals of water covered by a water use permit normally shall not result in an exceedance of the MFL through the 1-in-10 drought level of certainty (LOC) provided in the water use permit. The exception to this statement may occur either during extreme droughts or if a permittee violates the conditions of their permit.

The technical and administrative criteria applicable to water use are included in the "Basis of Review (BOR) for Water Use Permit". In order to attain a permit, an applicant must meet all criteria contained in district rules. The permit will be constrained by the most restrictive criteria applicable to each particular project. The permit criteria includes constraints on the volume of water reasonably needed for the project, limitation on the impacts allowable to other existing legal users and constraints aimed at protecting the water resources of the state.

The following is a discussion of existing and proposed CUP water resource protection criteria that act to prevent harmful over development to the aquifer in the Lower West Coast Planning Area. These regulatory water resource criteria have been considered in the establishment of the proposed MFLs for the LWC aquifer system in that they are the first line of defense against significant harm. Significant harm will not result to the Lower West Coast aquifers when meeting these criteria. Indeed, since its inception, implementation of the District CUP program has prevented significant harm to the water resources. As a result, no actual case studies exist where significant harm occurred and where a cause and effect relationship could be derived from data in the field. Therefore, familiarity of the standards of protection afforded through a CUP is necessary to develop the standards for significant harm.

1) Saltwater Migration: Harmful saltwater movement into fresh water portions of an aquifer is prohibited by district rules. Saltwater movement occurs either laterally along a coastal freshwater/saltwater interface, or vertically as upconning. District rules 40E2-301(a) and Section 3.4 of the Basis of Review, address both of these conditions and provide criteria limiting the influence of the applicant's proposed drawdown in conjunction with all other permitted users near the saltwater interface. However, users of saline water from within a saline aquifer may cause limited increases in salinity provided the criteria in Section 3.4.1 of the Basis of Review are met. These criteria prevent declines in water quality to a degree that the source is no longer useful to the applicant or other existing legal users and prevent the use of the saline water to cause harmful saltwater intrusion into freshwater aquifers. Water quality monitoring requirements are placed on permits where saltwater occurs near the withdraw and limiting conditions of the permit require the permittee to moderate or cease pumpage as required to prevent saltwater intrusion related to their use.

2) Wetland Protection: Withdraw of water that result in harmful shortening to hydropatterns of wetlands are prohibited. Proposed revisions to the existing rule will provide additional detail on the types and magnitude of allowable drawdown under different types of wetlands and provide a more detailed description of what types of wetlands/surface water bodies are protected under the rules (e.g. a slough vs. a drainage canal). Historically, District issued consumptive use permits have limited cumulative groundwater drawdown in the Water Table aquifer to less than 1 ft at the edge of a wetland when pumping the maximum day allocation for 90 days without recharge to the aquifer. These guidelines, which were

implemented in the 1980's, were never spelled out into rules but have been applied as guidelines ever since. These criteria were evaluated by a independent scientific peer review panel in the 1993 and further evaluated under a lengthy wellfield/wetland research study. Both of these evaluations concluded that these guidelines were sufficient in preventing harm to wetlands. Permits issued with impacts near the 1 ft drawdown guideline contain limiting conditions requiring monitoring of the wetland, and are required to mitigate harmful impacts including moderating or ceasing pumpage should harm result from their withdrawals.

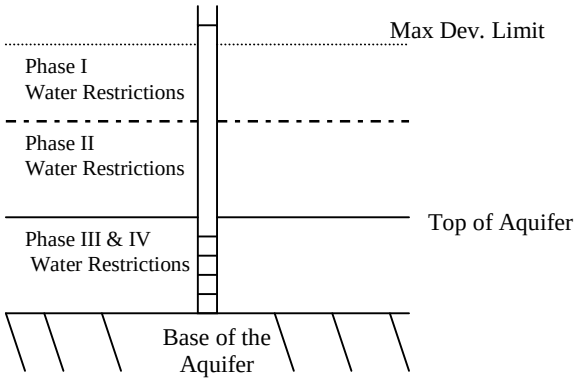
3) Pollution Protection: Withdrawals of water are not allowed to induce contaminants within an aquifer to move into uncontaminated areas of an aquifer (Section 3.5 Basis of Review). This requirement is met by restricting groundwater drawdowns resulting from the proposed use of water, at the area of contamination. However, District rules allow for the direct withdraw of contaminated water, provided the contaminated water will be remediate and the use will not expand the area of contamination.

4) Impacts to Land Use: Withdrawals of water that cause harmful impacts to adjacent land users are prohibited (Section 3.6 Basis of Review). Harmful impacts to land uses that are prohibited include sinkhole development, land subsidence, damage to crops through draining of seepage irrigation lands, and reductions in water levels within adjacent water bodies to the extent that their function is impaired (e.g. a surface water management impoundment which experiences erosion to the control structure caused by dewatering).

5) Interference with Existing Legal Users: District criteria requires a user to mitigate impacts to existing legal users whose withdraw capacity is impaired as a result of the new withdraw. Harmful interference to a use can occur as a reduction in well yield or change in water quality. Mitigation could be in the form of compensation for costs incurred and/or reduction of use.

6) Maximum Development Levels (MDL): If all other constraints on consumptive use withdrawals are met, how low should a well be allowed to dewater an aquifer? This question doesn't practically come up when dealing with the Water Table aquifer due to coastal saltwater intrusion and wetlands. However, in the Lower West Coast Planing Area, there are shallow semi-confined aquifers where this question is relevant. In order to prevent harmful dewatering of these aquifers, the District is proposing maximums developable level criteria for the Lower Tamiami, Sandstone and Mid-Hawthorn aquifers. The significant harm that these criteria are proposed to protect against is dewatering a semi-confined aquifer to a level below the structural top of the aquifer. To achieve this, drawdowns will be limited to a specific elevation above the top of the aquifer. The proposed height above the aquifer top, ranging between 20 to 40 ft, is based on observed seasonal variance in water levels for each aquifer during a 1 in 10 drought condition coupled with the amount of water level declines observed during past water shortage events. The concept is to limit CUP withdrawals to a level above the top of the aquifer in a manner to provide a buffer to protect against significant harm during drought events more severe than a 1 in 10 condition. Should water levels within the aquifer drop below the MDL, water shortage restrictions would be imposed. In this manner, the potential for

significant harm to the aquifer (dewatering below the structure top of aquifer) would be reduced and managed.



7) Water Shortage Restrictions: All District CUPs contain a limiting condition requiring the permittee reduce pumpage during a declared water shortage consistent with the provisions contained in rule 40E-21. The magnitude of the cutbacks are related to the efficiency of the use type and the severity of the drought.